CLAIMS

1. A video processing apparatus for specifying frames to be
start frames of a plurality of viewing segments when segmenting
5   a content, comprising:

        a specifying information memory storing pieces of
specifying information each showing a feature of frames to
be specified as start frames and each corresponding to a
different type of content;

10   a content obtaining unit operable to obtain a content;
        an information obtaining unit operable to obtain type
information showing the type of the obtained content;

        an extracting unit operable to extract from the
specifying information memory a piece of specifying
15   information corresponding to the type shown by the obtained
type information; and

        a specifying unit operable to specify start frames
present in the content, in accordance with the extracted piece
of specifying information.

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2. The video processing apparatus of Claim 1, wherein
        each piece of specifying information further shows a
feature of frames to be specified as presentation frames,
each of which is to be displayed as a representative still
25   image of a respective viewing segment, and

        the specifying unit further specifies presentation
frames present in the content, in accordance with the extracted
piece of specifying information.

30   3. The video processing apparatus of Claim 2, further

comprising:

an index storage unit operable to store, in correspondence with the content, display times of each start frame and presentation frame specified by the specifying unit.

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4. The video processing apparatus of Claim 2, wherein the features shown by the specifying information are detectable through at least one of video analysis, still image analysis, and audio analysis, and

10 the specifying unit specifies the start frames and presentation frames through at least one of video analysis, still image analysis, and audio analysis.

5. The video processing apparatus of Claim 4, wherein

15 the specifying information includes:

a first condition showing a feature of frames to be detected as candidates for presentation frames;

an exclusion condition showing a feature of frames to be excluded from candidates for presentation frames;

20 a second condition showing a feature of frames to be detected as candidates for start frames; and

a selection condition showing a relation between a presentation frame and a frame that is to be selected as a start frame, and

25 the specifying unit specifies the presentation frames by detecting frames satisfying the first condition from all frames present in the content and subsequently excluding frames satisfying the exclusion condition from the detected frames, and specifies the start frames by detecting frames

30 satisfying the second condition from all the frames present

in the content and subsequently selecting, from the detected frames, frames satisfying the relation shown by the selection condition with respect to the specified presentation frames.

5   6. The video processing apparatus of Claim 5, wherein
        the specifying unit includes:
            a plurality of detecting subunits each operable to detect frames having a different feature;
            an excluding subunit operable to exclude frames
10   satisfying the exclusion condition from frames satisfying the first condition; and
            a selecting subunit operable to select frames satisfying the relation shown by the selection condition from frames satisfying the second condition, and
15   the first condition, the exclusion condition, and the second condition each are an identifier of one of the detecting subunits to be used.

    7. The video processing apparatus of Claim 4, wherein
20   when operating in accordance with a piece of specifying information corresponding to a predetermined type of content, the specifying unit (i) detects from all the frames present in the content, large-caption start frames each of which is a first frame of a series of frames during which a caption
25   of a size larger than a threshold continuously appears in a predetermined region, small caption frames in each of which a caption of a size smaller than a threshold appears in a region other than the predetermined region, CM frames which constitute a commercial message, and transition frames each
30   of which is a first frame of a series of frames of similar

images, (ii) specifies as a presentation frame each frame remaining after removing the small-caption frames and the CM frames from the large-caption start frames, and (iii) specifies as a start frame, for each presentation frame, a

5   closest preceding transition frame to the presentation frame.

8. The video processing apparatus of Claim 4, wherein

when operating in accordance with a piece of specifying information corresponding to a predetermined type of content,

10   the specifying unit (i) excludes frames which constitute a commercial message from all the frames present in the content, (ii) detects from the remaining frames, large-caption start frames each of which is a first frame of a series of frames during which a caption of a size larger than a threshold

15   continuously appears in a predetermined region, small caption frames in each of which a caption of a size smaller than a threshold appears in a region other than the predetermined region, and transition frames each of which is a first frame of a series of frames of similar images, (iii) specifies as

20   a presentation frame each frame remaining after removing the small-caption frames from the large-caption start frames, and (iv) specifies as a start frame, for each presentation frame, a closest preceding transition frame to the presentation frame.

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9. The video processing apparatus of Claim 4, wherein

when operating in accordance with a piece of specifying information corresponding to a predetermined type of content, the specifying unit (i) detects from all the frames present

30   in the content, large-caption start frames each which is a

first frame of a series of frames during which a caption of a size larger than a threshold continuously appears in a predetermined region, small caption frames in each of which a caption of a size smaller than a threshold appears in a

5   region other than the predetermined region, CM frames which constitute a commercial message, and silent frames of which audio data is below a predetermined volume level, (ii) specifies as a presentation frame each frame remaining after removing the small-caption frames and the CM frames from the

10   large-caption start frames, and (iii) specifies as a start frame, for each presentation frame, a closest silent frame to the presentation frame.

10. The video processing apparatus of Claim 4, wherein

15   when operating in accordance with a piece of specifying information corresponding to a predetermined type of content, the specifying unit (i) excludes frames which constitute a commercial message from all the frames present in the content, (ii) detects from the remaining frames, large-caption start

20   frames each of which is a first frame of a series of frames during which a caption of a size larger than a threshold continuously appears in a predetermined region, small caption frames in each of which a caption of a size smaller than a threshold appears in a region other than the predetermined

25   region, and silent frames of which audio data is below a predetermined volume level, (iii) specifies as a presentation frame each frame remaining after removing the small-caption frames from the large-caption start frames, and (iv) specifies as a start frame, for each presentation frame, a closest

30   preceding silent frame to the presentation frame.

11. The video processing apparatus of Claim 4, wherein
when operating in accordance with a piece of specifying
information corresponding to a predetermined type of music
5   program, the specifying unit (i) detects from all the frames
present in the content, large-caption start frames each of
which is a first frame of a series of frames during which
a caption of a size larger than a threshold continuously appears
in a predetermined region, small caption frames in each of
10 which a caption of a size smaller than a threshold appears
in a region other than the predetermined region, CM frames
which constitute a commercial message, and music-start frames
each of which is a first frame of a series of frames of which
audio data represents a piece of music data, (ii) specifies
15 as a presentation frame each frame remaining after removing
the small-caption frames and CM frames from the large-caption
start frames, and (iii) specifies as a start frame, for each
presentation frame, a closest preceding music-start frame
to the presentation frame.
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12. The video processing apparatus of Claim 4, wherein
when operating in accordance with a piece of specifying
information corresponding to a predetermined type of music
program, the specifying unit (i) excludes frames which
25 constitute a commercial message from all the frames present
in the content, (ii) detects from the remaining frames,
large-caption start frames each of which is a first frame
of a series of frames during which a caption of a size larger
than a threshold continuously appears in a predetermined
30 region, small caption frames in each of which a caption of

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a size smaller than a threshold appears in a region other than the predetermined region, and music-start frames each of which is a first frame of a series of frames of which audio data represents a piece of music data, (iii) specifies as a presentation frame each frame remaining after removing the small-caption frames from the large-caption start frames, and (iv) specifies as a start frame, for each presentation frame, a closest preceding music-start frame to the presentation frame.

13. The video processing apparatus of Claim 4, wherein

when operating in accordance with a piece of specifying information corresponding to a predetermined type of content, the specifying unit (i) detects from all the frames present in the content, large-caption start frames each of which is a first frame of a series of frames during which a caption of a size larger than a threshold continuously appears in a predetermined region, small caption frames in each of which a caption of a size smaller than a threshold appears in a region other than the predetermined region, CM frames which constitutes a commercial message, and speech-start frames each of which is a first frame of a series of frames of which audio data represents a speech of a specific speaker, (ii) specifies as a presentation frame each frame remaining after removing the small-caption frames and the CM frames from the large-caption start frames, and (iii) specifies as a start frame, for each presentation frame, a closest preceding speech-start frame to the presentation frame.

14. The video processing apparatus of Claim 4, wherein

when operating in accordance with a piece of specifying
information corresponding to a predetermined type of content,
the specifying unit (i) excludes frames which constitute a
commercial message from all the frames present in the content,
5   (ii) detects from the remaining frames, large-caption start
frames each of which is a first frame of a series of frames
during which a caption of a size larger than a threshold
continuously appears in a predetermined region, small caption
frames in each of which a caption of a size smaller than a
10 threshold appears in a region other than the predetermined
region, and speech-start frames each of which is a first frame
of a series of frames of which audio data represents a speech
of a specific speaker, (iii) specifies as a presentation frame
each frame remaining after removing the small-caption frames
15 from the large-caption start frames, and (iv) specifies as
a start frame, for each presentation frame, a closest preceding
speech-start frame to the presentation frame.

15. The video processing apparatus of Claim 4, wherein
20   when operating in accordance with a piece of specifying
information corresponding to a predetermined type of content,
the specifying unit (i) detects from all the frames present
in the content, CM-start frames each of which is a first frame
of a series of frames which constitute a commercial message,
25 and transition frames each of which is a first frame of a
series of frames of similar images, (ii) specifies each
CM-start frame as a start frame, and (iii) specifies as a
presentation frame, for each start frame, a closest subsequent
transition frame to the start frame.
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16. The video processing apparatus of Claim 2, further comprising:

a playback unit operable to play back the content starting from a start frame specified by the specifying unit.

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17. The video processing apparatus of Claim 16, further comprising:

an index storing unit operable to store pairs display times of each start frame and presentation frame specified

10   for a respective viewing segment by the specifying unit;

a display unit operable to display a presentation frame specified for each viewing segment by the specifying unit; and

a user-selection unit operable to select at least one

15   of the presentation frames displayed, in accordance with a user selection, wherein

the playback unit plays back the content starting from a start frame of a viewing segment to which the user-selected presentation frame belongs.

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18. The video processing apparatus of Claim 17, wherein

the display unit displays the presentation frames by generating a thumbnail image of each presentation frame and displaying the thumbnail images in list form.

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19. The video processing apparatus of Claim 17, wherein

the user-selection unit stores the selected presentation frame as a reference image into the specifying information memory, and

30   the specifying unit specifies the presentation frames

by detecting frames which are similar to the reference image with respect to a location of a region in which a caption appears.

5   20. The video processing apparatus of Claim 1, further comprising:

a recording unit operable to obtain a content and type information of the content, and to record the content to a recording medium in correspondence with the type information,

10 wherein

after the recording unit records the type information and at least part of the content, the content obtaining unit sequentially obtains the part of the content from the recording medium, and

15   the specifying unit sequentially specifies start frame present in the part of the content obtained by the content obtaining unit.

21. The video processing apparatus of Claim 1, further

20 comprising:

a recording unit operable to obtain a content and type information of the content, encode the content, and record the encoded content in correspondence with the type information, wherein

25   after the recording unit records the type information and encodes at least part of the content, the content obtaining unit sequentially obtains the encoded part of the content, and

the specifying unit obtains analyses of the encoded part

30 conducted by the recording unit for the encoding, and

sequentially specifies start frame present in the encoded part using the analyses.

22. The video processing apparatus of Claim 1, further comprising:

an updating unit operable to obtain a new version of specifying information corresponding to a specific type of content, and record the new version of specifying information to the specifying information memory.

23. The video processing apparatus of Claim 22, wherein the updating unit obtains the new version of specifying information when connected via a communication network to a provider apparatus for providing specifying information, and judging that the new version of specifying information is available, and

the new version of specifying information is recorded to the specifying information memory by updating a piece of specifying information stored therein corresponding to the specific type to the new version.

24. The video processing apparatus of Claim 23, wherein the judgment as to whether the new version of specifying information is available is made each time the specifying unit processes the specific type of content.

25. An integrated circuit for use in a video processing apparatus that specifies frames to be start frames of a plurality of viewing segments when segmenting a content, the video processing apparatus having a specifying information

memory storing pieces of specifying information each showing a feature of frames to be specified as start frames and each corresponding to a different type of content, the integrated circuit comprising:

5   a content obtaining module operable to obtain a content;

an information obtaining module operable to obtain type information showing the type of the obtained content;

an extracting module operable to extract from the specifying information memory a piece of specifying
10   information corresponding to the type shown by the obtained type information; and

a specifying module operable to specify start frames present in the content, in accordance with the extracted piece of specifying information.

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26. A video processing method for use by a video processing apparatus that specifies frames to be start frames of a plurality of viewing segments when segmenting a content, the video processing apparatus having a specifying information
20   memory storing pieces of specifying information each showing a feature of frames to be specified as start frames and each corresponding to a different type of content, the video processing method comprising the steps of:

obtaining a content;
25   obtaining a type information showing a type of the obtained content;

extracting from the specifying information memory a piece of specifying information corresponding to the type shown by the obtained type information; and
30   specifying start frames present in the content, in

accordance with the extracted piece of specifying information.

27. A video processing program for causing a device to specify frames to be start frames of a plurality of viewing segments when segmenting a content, the device having a specifying information memory storing pieces of specifying information each showing a feature of frames to be specified as start frames and each corresponding to a different type of content, the video processing program comprising the steps of:

obtaining a content;

obtaining a type information showing a type of the obtained content;

extracting from the specifying information memory a piece of specifying information corresponding to the type shown by the obtained type information; and

specifying start frames present in the content, in accordance with the extracted piece of specifying information.